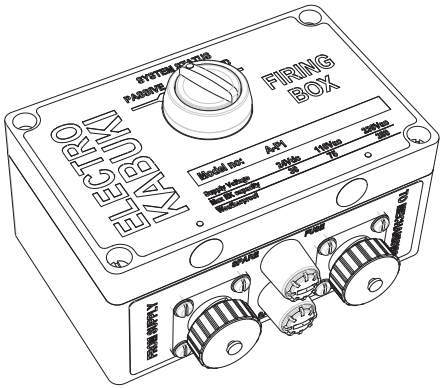
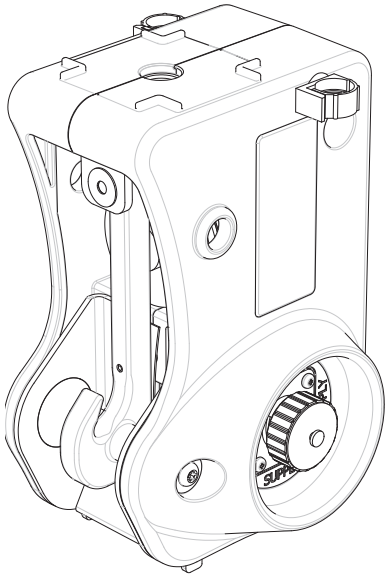
User Manual

ELECTRO KABUKI DROP 1.5

Mechanism • Firing Unit • Cabling





The Electro Kabuki Drop is part of a range of equipment used in the theatre/events industry. Some more devices are shown on the back cover.

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Index

1 Safety p1

2 Technical Specification p4

3 Features & Dimensions p7

4 Mounting and Electrical Connection p8

5 Maintenance and Servicing p12

6 Ordering Codes p14

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Section 1 - Safety

The function of the Electro Kabuki Drop is to suspend a load and release it on command from a remote location. Although the equipment is highly reliable, it must be remembered that NO SYSTEM IS 100% RELIABLE. The Electro Kabuki must therefore not be used in an application where untimely release of the load might cause injury, death or damage to property.

1.1 Load limits

The Electro Kabuki is designed to hold and release a maximum combined static and dynamic load of 50kg(490N). For the safety of all persons and equipment nearby it is important that this load is never exceeded and users must ensure that all loads and forces that may be present are included in the calculation of the total loading. This is of particular importance when the mechanism is used outside, where wind forces may form a high proportion of the total loading.

It is important to make extra allowance for shock or suddenly applied loads which could increase total loading to a point several times that of the static condition. If in doubt always air on the side of caution and use more mechanisms to support the load.

At the other end of the scale, the Electro Kabuki will operate reliably even with very light loads. The special design of the remnance spring ensures that even without a load present, rotation of the load arm will take place whenever the unit is 'fired'.

1.2 Maintenance for safety

It is important that the Electro Kabuki is correctly maintained to ensure that safety is maintained and the maximum load capability is available for use.

If load capacity falls, the most likely cause is failure of the armature to make full contact with the pole faces of the magnet, The reason for this might either be damage to the pole faces or foreign matter between the armature and the pole faces. For details of the various features of the Electro Kabuki see section 3.

The equipment should be regularly inspected if in constant use and when first used after storage. See section 5 for details of the required maintenance and servicing.

Inspections and maintenance should not be limited to the Electro Kabuki itself; the various mounting bolts, brackets, structures and cabling must also be checked for tightness, wear and damage.

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1.3 Competent persons

The equipment must only be installed and operated by persons who:

- are aware of the potential hazards of restrained or supported loads
- know the principle of operation of the Electro Kabuki and Firing Unit
- have authority to prevent its use if, in their opinion, the application is unsafe
- have studied this user manual

1.4 System configuation

Ensure that the Electro Kabuki's in any given multiple unit installation are of the same type, the same voltage (110Vac or 230Vac) and the same connector type.
The use of different voltages may not be noticed until the time of firing when mechanisms may fail to release.Transferred loading can force mistimed release, resulting in swinging or sideways displaced loads. Installation must always be tested with the safety catch on to prove correct function.

If the Electro Kabuki is used in conjunction with other equipment, care must be taken to ensure compatibility.

1.5 Mounting

Single M12 bolt at either of the two locations specified on the diagram in Section 3.1. Note the maximum penetration depth of the M12 bolt.

Tightening torque for the M12 mounting bolt should be 40 Nm. Thread locking compound can be used where extra assurance is required.

See section 4 for detailed information regarding mounting of the unit. Note that the limits stated in that section must not be exceeded or safety will be compromised.

1.6 Safety catch

A safety catch is provided to prevent accidental load release and provide a facility for testing the system (without releasing the load). The safety catch should be locked on (using the holes in the mounting plate and disc) until it is safe to release the load.

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1.7 Electrical connection

Electrical connections are made using AMP CPC Series 1. Safe operation cannot be guaranteed if other makes or models of connectors are used with the Electro Kabuki.

Note that cable connectors are colour coded to the socket label on the Electro Kabuki. In addition, the cable connectors are keyed to prevent them being inserted into the wrong socket. Do not try to force a connection.

Connecting and interlinking cables must be adequately supported along their length and strain relief should be provided at the points of connection. A suitable strain relief anchoring point is provided just above the connector.

Never install or dismantle live cables; the cable which delivers power to the firing unit should be the last one fitted during installation, and the first removed during dismantling.

Electro Kabuki can be set to either circuit 1 or circuit 2 to allow 2 drops at different times. you will need a circuit selector to use this option once set
The circuit version is print on the label on the back of the Kabuki and also stamped on the front above and to the left hook.

When ordering Electro Kabuki's you will need to state how many circuits 1 or 2 you require. If not stated all will be supplied as circuit 1's only.

1.8 Transportation

There are 2 holes in the top of the frame which provide a means of threading the Electro Kabuki onto a carrying strap.

The Electro Kabuki should never be carried by a cable which is connected to the Magnet Module. The electrical connectors in the Magnet Module are not designed to be load bearing.

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Section 2 - Technical Specification

2.1 Mechanical

mass:	Electro Kabuki	-	1.4 kg
	Firing Unit (F1H, F1P)	-	0.75 kg
	Circuit selector A-CS + Firing Unit Clamp (CLA-2)	-	
size:	see section 3		
	Splitter box	-	0.97 kg
load capacity:	50 kgs maximum (all Electro Kabukis), when used in accordance with the user manual		
ambient temperature:	only use within the range -5^{0}C to + 45^{0}C		

2.2 Electrical

Electro Kabuki:

power consumption: (at 20^{0}C magnet coil temp) EK1.5P 6.6W (impulse)

voltage options:
110Vac (50 Hz or 60Hz)
230Vac (50 Hz or 60 Hz)
24VDC (on request)

All Kabuki's are provided with a metallic oxide varistor for transient peak voltage damping. AC Magnet Modules also incorporate a bridge rectifier circuit.

Maximum pulse duration for 'energise to release Electro Kabuki's is 3 seconds (avoid holding down the 'fire' button on the Firing Unit)
Circuit options: All units will be circuit 1 unless otherwise re quested.

connector options: AMP[1] CPC Series 1

protection: AMP[1] connectors - are weatherproof

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Firing Unit:

supply voltage: 110Vac (50 or 60Hz)
230Vac (50 or 60Hz))

capacity: The number of Electro Kabukis in a multiple system is limited by the current rating of the Firing Unit: -

110Vac Firing Unit	75 Electro Kabukis
230Vac Firing Unit	200 Electro Kabukis
24VDC (on request)	20 Electro Kabuki's

Note
Very long cable runs may produce excessive voltage drop. Always test the system.

fuse rating: 8 A

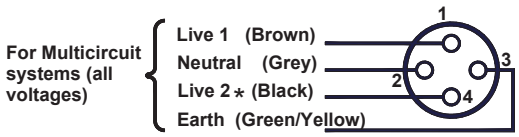
connector options: AMP) CPC Series 1

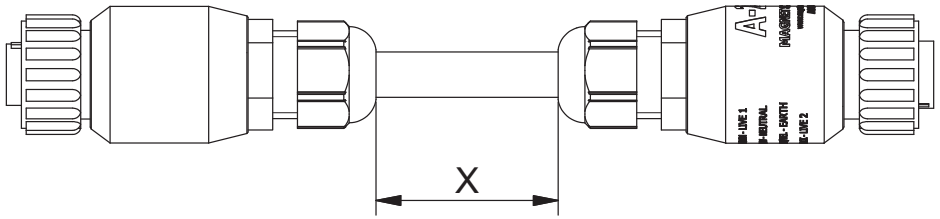
protection: Firing Units fitted with AMP) Connectors are weatherproof

Cable:

Cable is fitted with connectors to suit the Electro Kabuki. Cable Connection details are shown below.

* Not used on supply cables





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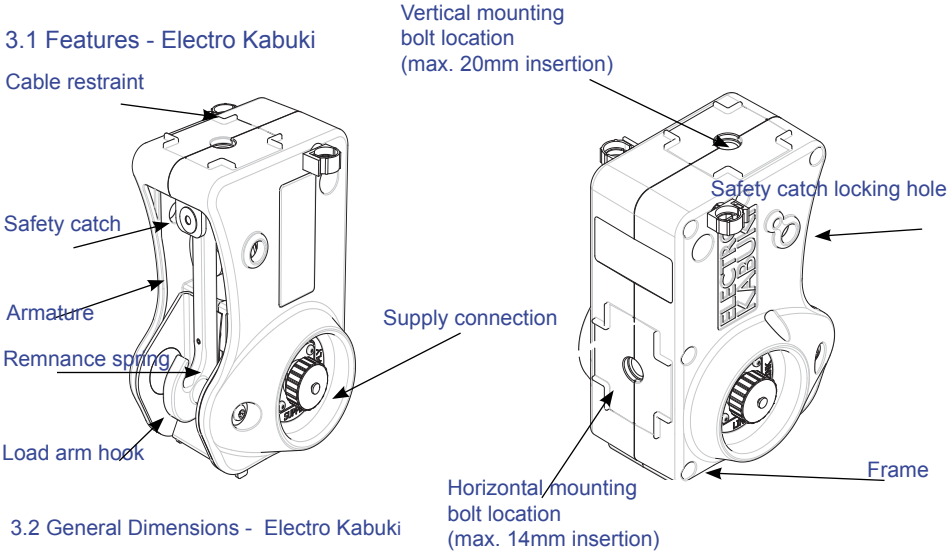
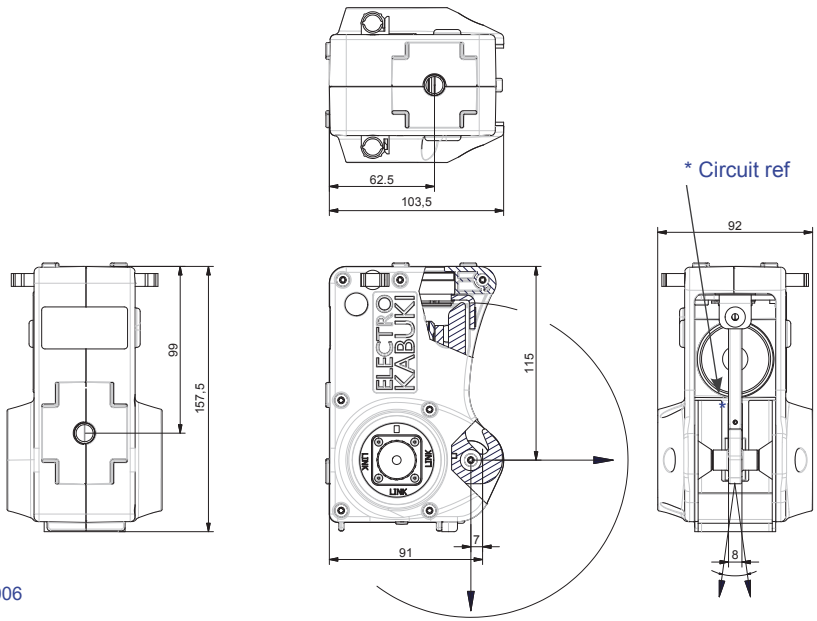
Section 3 - Features and Dimensions

3.1 Features - Electro Kabuki



3.2 General Dimensions - Electro Kabuki



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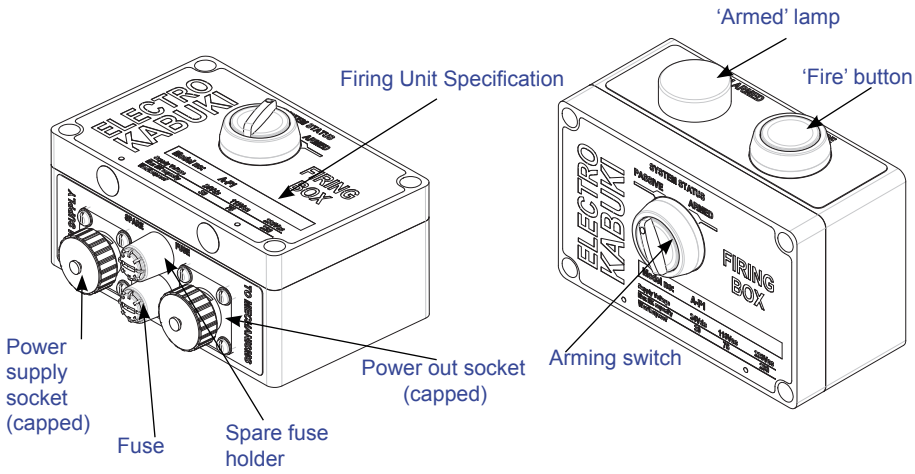
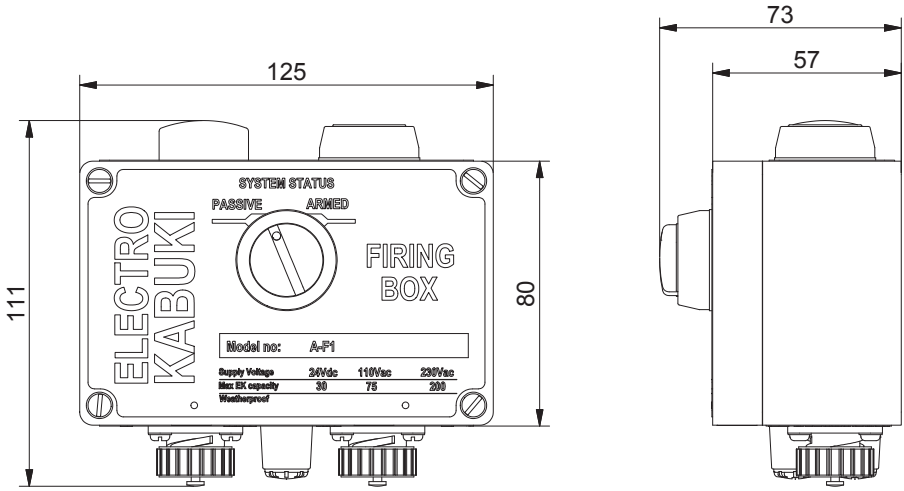
3.3 Features - Firing Units (F1P & F1H)



3.4 General Dimensions - Firing Units (F1P & F1H)



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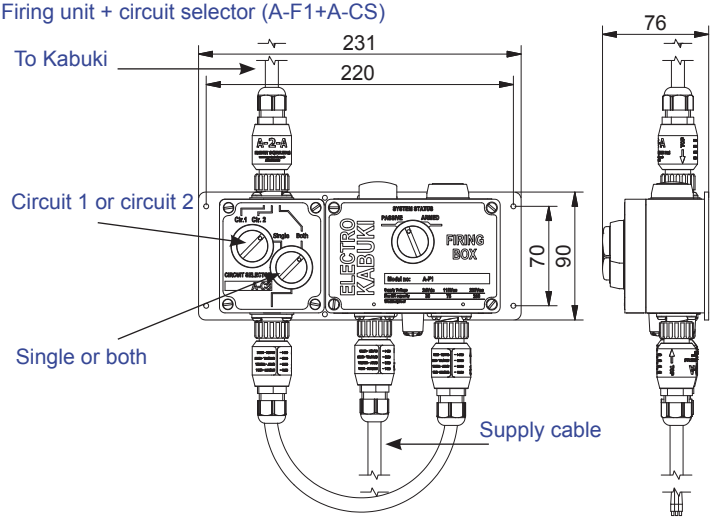
3.5 General dimensions

Firing unit + circuit selector (A-F1+A-CS)



Section 4 - Mounting & Electrical Connection

4.1 General

The correct mounting of the Electro Kabuki is important for safe and proper functioning.

It is important to remember that the action of releasing a heavy load can set up considerable 'recoil' vibrations in the supporting structrue unless carefully designed.

4.2 Mechanical fixing

Single M12 bolt of Property Class 8.8. Such bolts have a minimum ultimate tensile load capability of 51900N (5290kgf). The recommended tightening torque for such bolts (clean and unlubricated) is 40 Nm.

Care must be exercised in the selection of the bolt length in order to restrict the insertion of the bolt into the Magnet Module to a maximum of 14mm. Serious damage to the Magnet Module can result if an overlength bolt is used.

For fixing to 2" (150mm) diameter poles, half couplers drilled for M12 low head socket screw and spring washer are supplied.

The line of action of the load should not lie more that 5^0 either side of the principal load axis (section 3).

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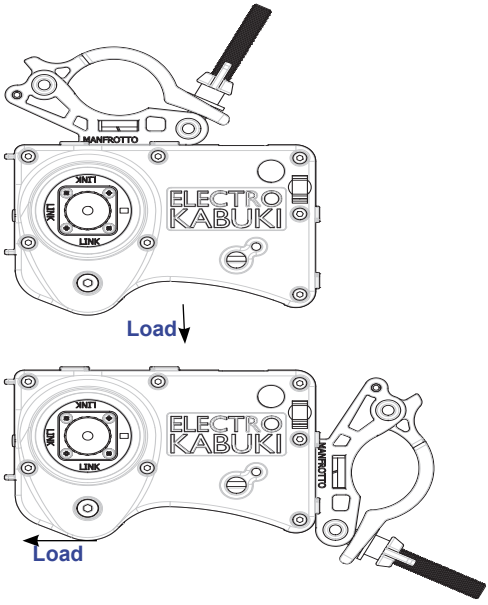
Mounting Arrangements

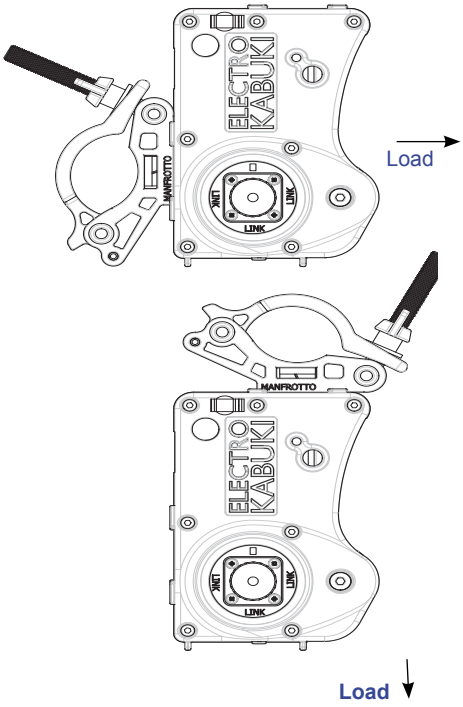
The arrangements below are examples, they do not represent all possibilities.
The important points are:-

- That the load directly opposes the mounting position when half couplers are used.
- That the load is parallel to or normal to the rear face of the frame when surfacing mounting is used.

Horizontal



Vertical



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4.3 Single unit electrical connection

Care should be exercised in the support and routing of the link cable between the Firing Unit and the Electro Kabuki in order to minimise strain on the connections and prevent the cable forming a tripping or choking hazard.

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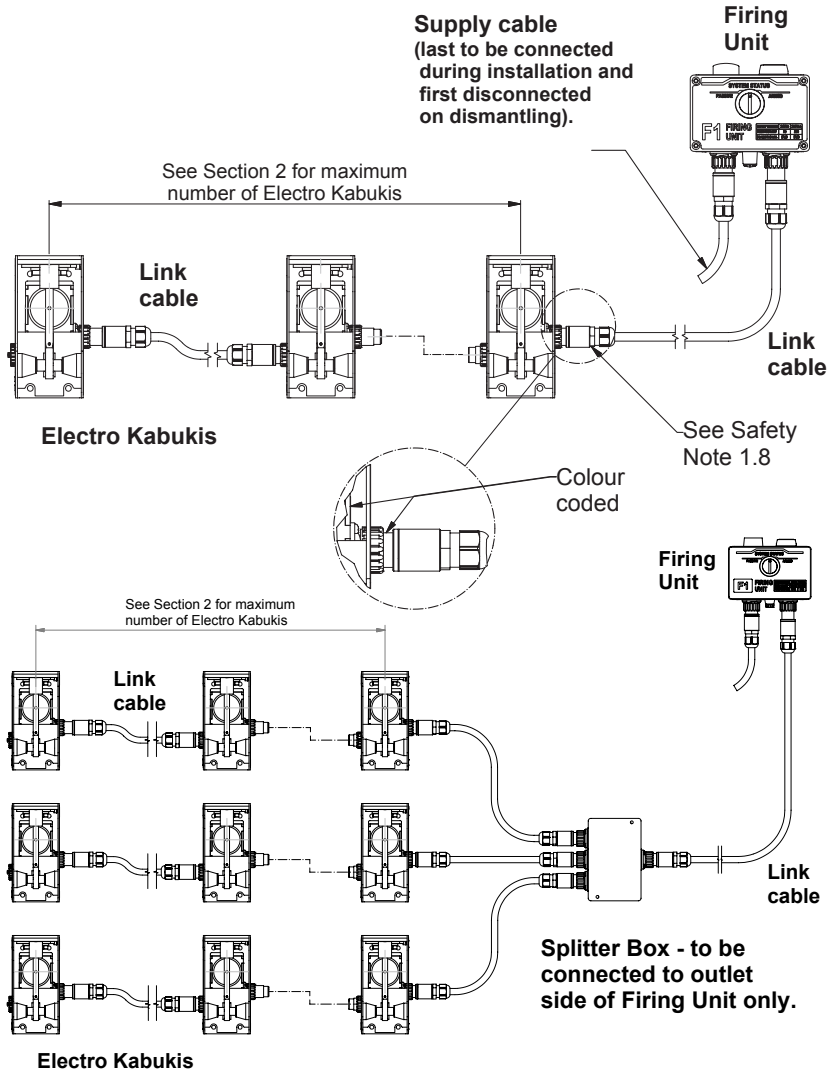
4.4 Multiple unit electrical connection

Electro Kabukis maybe 'daisy chained' to provide a release system spanning a large distance and/or supporting a greater load.



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Section 5 - Maintenance and Servicing

5.1 Maintenance

The Electro Kabuki and Firing Units are very robost devices and require minimal attention, but the following must be observed to maintain safe operation and optimal performance:-

storage: Equipment must be stored in a clean, dry environment and ambient temperature within the range -5^{0}C to +55^{0}C. Relative humidity should be no greater than 80% (non-condensing). Ensure there is adequate protection to avoid physical damage to the equipment. The armature should be attached to the magnet pole faces during periods of non-use (this protects the armature and pole faces from damage.)

inspection: Regular inspections, at intervals to suit the frequency of use, are essential. Particular attention should be paid to:

armature and magnet pole faces:
The armature is attached to the load arm by a centre mounting screw. Check that the screw is in good condition and secure. Slight damage to the metal surfaces or presence of foreign particles will greatly reduce the holding force of the magnet. Keep the surfaces clean and protected from damage. Replace parts if the specified holding force cannot be achieved.

connectors:
Magnet Module, Firing Unit and cable connectors should be clean and free from damage. Use the dust caps on the AMP connectors to protect the contact from dust and fluids. Replace any items that are not in good order.

load arm:
The load arm must swing freely on its spindle. Check the condition of the load arm/hook to ensure that it has not suffered damage. If there are signs of wear or cracking, the load arm must be replaced.

safety catch:
The safety catch osition device that is held by a spring. Check that the spring is in good working order and that the catch itself has not suffered damage.

frame:
Check the condition of the frame and labels. If there are signs of structural damage to the frame or the labels are illegible, the frame should be replaced.

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5.2 Servicing

Although day-to-day maintenance can be carried out by the customer, we strongly recommend that the equipment is returned to the manufacturer at regular intervals for a full service including replacement of the load arm. This will promote a long and trouble-free service life. The interval between services depends upon the frequency of use; 12 months in the case of high usage rate, but no more than 36 months in any case.

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Section 6 - Ordering Codes

6.1 Equipment

Electro Kabuki - order example

EK1.5 P A 230 C1

Frame		EK1.5				
Magnet Module	- energise to release		P			
Connection type	- AMP			A		
Electrical supply					110 230	
Circuit 1 or Circuit 2						C1 C2

Firing Unit - order example

F1P A 230

Type for	- energise to release	F1P		
Connection type	- AMP		A	
Electrical supply				110 230

Cable - order example

A 50 A

Connection type	- - AMP - Bare	 A B		
Length - specified in (metres)			X	
	- AMP - Bare			A B

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6.2 Spare parts

Item	Description	Unit of Order	Part Number
	Armature, mounting screw washer	Set	EK1ZZE
Clamp	Clamp and Bolt (500kg Half Coupler)	Each	CLA-2
	AMP connector dust cap	Each	A-DC
Cable Parts	AMP in-line coupler	Each	A-IC
	AMP 3-way splitter	Each	A-SP3
Firing Unit	8A fuses (pack of 10)	Pack	F1-8A
	Circuit Selector	Each	A-CS

Note Please quote the serial number of the device for which you require the spare (ie S . . . . .)

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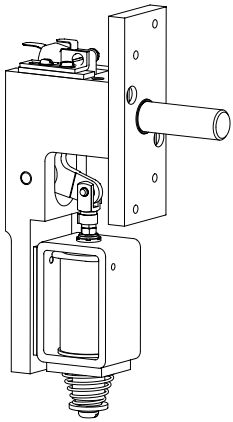
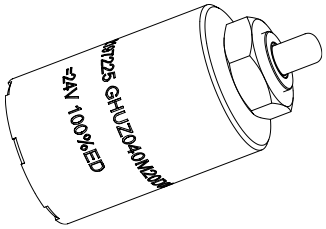
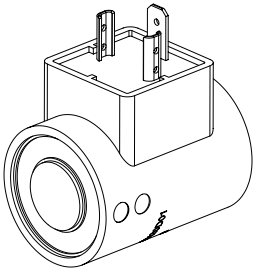


Electric Shotbolts

Very robust and available with different mounting plates, position switches and manual overrides. Secure locking of hinged and sliding apparatus, revolves, doors, floor traps etc

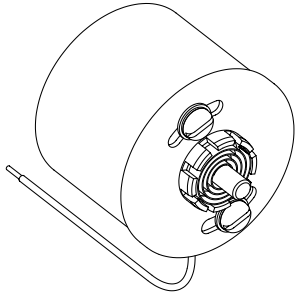




Electro-Magnets

2 types - hold when power is applied and release when power is applied.

High performance devices for many applications

Rotary Solenoids

Up to 110° rotation and spring return or double-acting. Simple and effective where rotary motion is needed.